

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
CERTIFICATE OF WAIVER

ISSUED TO

Project Wing
Responsible Person: Chris Jackman
Waiver Number: 107W-2018-12649A

ADDRESS –

100 Mayfield Avenue
Mountain View, CA 94043

This certificate is issued for the operations specifically described hereinafter. No person shall conduct any operation pursuant to the authority of this certificate except in accordance with the standard and special provisions contained in this certificate, and such other requirements of the Federal Aviation Regulations not specifically waived by this certificate.

OPERATIONS AUTHORIZED

Transient operation of a small unmanned aircraft system (sUAS) over non-participating human beings, for the purposes of small package delivery testing, in accordance with the Partnership for Safety Promotion agreement.

LIST OF WAIVED REGULATIONS BY SECTION AND TITLE

14 CFR §107.39 Operations over human beings

STANDARD PROVISIONS

1. A copy of the application made for this certificate shall be attached to and become a part hereof.
2. This certificate shall be presented for inspection upon the request of any authorized representative of the Administrator of the Federal Aviation Administration, or of any State or municipal official charged with the duty of enforcing local laws or regulations.
3. The holder of this certificate shall be responsible for the strict observance of the terms and provisions contained herein.
4. This certificate is nontransferable.

NOTE—This certificate constitutes a waiver of those Federal rules or regulations specifically referred to above. It does not constitute a waiver of any State law or local ordinance.

SPECIAL PROVISIONS

Special Provisions Nos. 1 to 26, inclusive, are set forth on the attached pages.

This Certificate of Waiver is effective from May 21, 2018 to May 31, 2022 and is subject to cancellation at any time upon notice by the Administrator or an authorized representative.

OFFICE OF THE EXECUTIVE DIRECTOR

Flight Standards Service

**SPECIAL PROVISIONS ISSUED TO
Project Wing**

General.

This waiver supercedes waiver 107W-2018-12649 which superseded 107W-2017-03788. Waiver number 107W-2018-12649 and 107W-2017-03788 are no longer valid and may not be used for sUA flight operations.

The FAA's Flight Standards Service has reviewed your application to ensure compliance with the requirements of 14 CFR § 107.200. The Administrator finds that the proposed sUAS operation can be conducted safely under the provisions of this Certificate of Waiver (Waiver) as listed below, because you have established adequate mitigations for risks involved with operating your sUAS in the manner you described. Adherence to the provisions of this Waiver establishes the required level of safety within the national airspace system.

This Waiver may be canceled at any time by the Administrator, the person authorized to grant the Waiver, or the representative designated to monitor a specific operation. As a general rule, this Waiver may be canceled when it is no longer required, there is an abuse of its provisions, or when unforeseen safety factors develop. Failure to comply with any provision listed below is a violation of the terms of this Waiver and may serve as justification for cancellation.

List of Regulations Waived by Section and Title. The following regulations are waived:

14 CFR § 107.39, Operations over human beings, is waived to allow transient sUAS operations over non-participating human beings.

Common Provisions. The Responsible Person is directly responsible for safety of operations conducted under this Waiver and will ensure the remote Pilot in Command (PIC), manipulator of the controls, and Visual Observer (VO) complies with all provisions of this Waiver.

1. The Responsible Person listed on the Waiver is responsible to the FAA for the safe conduct of the operations. Prior to conducting operations that are the subject of this Waiver, the responsible person—
 - a. Must ensure the remote PIC, manipulators of the controls, and VO are informed on the terms and provisions of this waiver and the strict observance of the terms and provisions herein;
 - b. Must ensure the remote PIC, manipulators of the controls, and VO are informed and familiar with part 107 regulations not waived; and
 - c. The above must be documented and must be presented for inspection upon request from the Administrator or an authorized representative.

2. This Waiver may be combined with waiver number 107W-2016-01223 as amended and waiver 107W-2018-13895 as amended. Operations at the Waymo test facility must comply with § 107.31 and may not be combined with waiver 107W-2018-13895 as amended. This waiver must not be combined with any other waiver(s), authorization(s), or exemption(s) without specific authorization from the FAA;

3. The FAA has the authority to cancel or delay any or all flight operations if the safety of persons or property on the ground or in the air, are in jeopardy or there is a violation of the terms of this Waiver;
4. A copy of this Waiver must be available during sUAS operations that are the subject of this Waiver;
5. The Responsible Person listed on this Waiver must maintain a current list of pilots by name and remote pilot certificate number used in the Waiver holder's operations. This list must be presented for inspection upon request from the Administrator or an authorized representative;
6. The Responsible Person listed on this Waiver must maintain a current list of small unmanned aircraft (sUA) by registration number(s) used in the Waiver holder's operations. This list must be presented for inspection upon request from the Administrator or an authorized representative;

Operation over human beings Special Provisions. sUAS operations over non-participants may be conducted, provided—

Operational Provisions

7. sUAS flight routes must be planned, and sUAS must be programmed for semi-autonomous flight as described in the waiver application;
8. If the remote PIC is not proficient as described in the waiver application, prior to performing operations subject to this Waiver, they must complete the additional training as described in the waiver application. During this training, the sUAS operations must adhere to the standard requirements of part 107 (without waiver). Operations over human beings during this training is prohibited;
9. The Responsible Person listed on this Waiver must ensure each remote PIC is trained in a manner consistent with how the sUAS will be operated under this Waiver. All training and demonstration for any remote PIC and VO must be documented and made available upon request by the Administrator or an authorized representative. Training operations may only be conducted under the standard requirements of part 107 (without waiver). The training must include—
 - a. sUA limitations,
 - b. sUA programming,
 - c. sUA Operational procedures,
 - d. Abnormal and contingency procedures,
 - e. Evasive and Emergency procedures,
 - f. Crew Resource Management,
 - g. sUA flight training, and
 - h. A demonstration of sUA ground and flight skills;

10. Prior to operations conducted under this Waiver, the Responsible Person must develop, and the Responsible Person must ensure, the developed operations manual is made available to the Administrator. As described in the Waiver application, the Responsible Person must ensure all operations conducted under this Waiver follow the procedures as outlined in the operations manual. If a discrepancy exists between the provisions in this Waiver and the procedures outlined in the operations manual, the provisions of this Waiver take precedence and must be followed;
11. The operations manual developed by the Responsible Person contains at least the following items:
 - a. Operator name, address, and telephone number,
 - b. Method of distribution and revision,
 - c. Certificate of Waiver. The operations manual must include a copy of the current Waiver(s),
 - d. Aircraft description and limitations list by aircraft type and model,
 - e. Method to ensure safety of non-participating persons and aircraft,
 - f. Safety briefing of Direct Participants,
 - g. Direct Participants Minimum Requirements. In accordance with this Waiver, the Responsible Person must specify the minimum requirements for all Direct Participants in the operating manual, and the method used by the Direct Participants to meet those minimum requirements,
 - h. Method of communications,
 - i. Normal operating procedures,
 - j. Abnormal operating procedures,
 - k. Emergency procedures
 - l. Crew Resource Management,
 - m. Risk management, an
 - n. Accident Notification. The operations manual must contain procedures for notification and reporting of accidents in accordance with this Waiver;
12. The Responsible Person may update or revise the operation manual. The responsible person must ensure tracking of manual revisions, all manuals used or referenced for operations conducted under this Waiver are updated, and revised manuals are submitted to the Administrator. If the Responsible Person or Administrator determines that any update or revision would affect the basis for which the FAA granted this Waiver, then the Responsible Person must apply for an amendment to their Waiver;
13. If the remote PIC loses command or control link with the sUA, the sUA must immediately follow a predetermined route and land at the pre-designated location;

14. Flight operations recordkeeping requirements. Records shall be retained for a period of 90 days after the expiration date of the Waiver. The Responsible Person shall keep at its principal business office or at other places approved by the Administrator, and provide the Administrator on a monthly basis by email to 9-AFS-820-Part107Reports@faa.gov the following:
 - a. For each sUA flight conducted under the terms of this waiver—
 - i. Registration number of the sUA,
 - ii. Make and model of the sUA,
 - iii. Name and certificate number of each remote PIC designated prior to or during the sUA flight,
 - iv. Name of the VO if used,
 - v. Duration of the sUA operation;
 - b. sUA equipment malfunctions. Reportable sUA equipment malfunctions include, but are not limited to the following:
 - vi. On-board flight control system,
 - vii. Any portion of the navigation system to include GPS functionality,
 - viii. Power plant malfunction or failure,
 - ix. Battery malfunction or failure,
 - x. Electrical power system malfunction or failure, and
 - xi. Control station malfunction or failure,
 - c. Collision with an object located on, or attached to the ground, or in the air,
 - d. Ground impact resulting in any damage to the sUA or its payload,
 - e. A list and description of any occurrence in which the sUA or its payload impacts a person not participating in the operation
 - f. Number of lost link and control override events; and,

Technical Provisions

15. sUAS operations under this Waiver are prohibited after modification to the sUAS design or performance capabilities until completion and documentation of the Function and Reliability testing on the hardware and software as described in the waiver application. Repair and replacement of damaged components is allowed with a replacement part that is exactly the same as the original; no substitutions are allowed without FAA approval;
16. The aircraft must meet or exceed the expected system failure rate and average risk level prior to performing waived operations as described in the waiver application. If the system failure rate or average risk level are above the level stated in the waiver application, operations conducted under this Waiver are not permitted;

17. As describe in the waiver application, the Responsible Person must maintain the sUAS and its components in accordance with manufacturer's instructions and recommendations. The aircraft manufacturer may provide the maintenance program, or if one is not provided, the Responsible Person must develop a maintenance program prior to conducting operations that are the subject of this Waiver. sUA maintenance includes scheduled and unscheduled overhaul, repair, inspection, modification, replacement, and system software upgrades of the sUAS and its components necessary for flight. A log of all maintenance performed must be kept for each aircraft operated under this waiver, and available to the remote PIC to review prior to operations conducted that are the subject of this waiver. Each sUA maintenance log must be presented to the Administrator when requested. These procedures must be added in the operations manual;

Environmental Provisions

18. Any sUAS that has undergone maintenance must undergo a functional test flight prior to conducting operations under this Waiver. A log entry must be made for each functional test flight. The log entry must contain at minimum the—
 - a. Calendar date,
 - b. sUA registration number,
 - c. Remote PIC who performed the functional test flight,
 - d. Duration of the flight, and
 - e. the result of the functional flight test;
19. Operations under this Waiver are to be conducted in Class G airspace only unless specific airspace authorization or Waiver is received from the FAA in accordance with § 107.41;
20. As described in the waiver application, all operations conducted under this Waiver must remain over sparsely populated areas, and may not exceed 200 feet Above Ground Level (AGL);
21. Prior to conducting Waivered operations, a site assesement must be performed as described in the waiver application;
22. Waivered operations over non-participants are restricted to transient flight only, and must remain at least 10 feet from any non-paricipating human being;
23. Sustained flight over non-participant human beings is prohibited;
24. Operations that are subject to this Waiver, are not permitted over open air assemblies of human beings;

25. Takeoff, landing, and package pickup are limited to restricted access locations. During all phases of flight, including package pick-up and delivery, the remote PIC must maintain the ability to see the sUA to determine compliance with § 107.31(a);
26. Operations subject to this Waiver are limited to the criteria and geographic locations as described in waiver application 107W-2018-12649, the three locations described in 107W- 2018-13895, and the Waymo test facility.